

# Patient Surveillance Algorithms for the Emergency Department

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Joint work with:

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Machine Learning

# Motivation

## Electronic Medical Record (EMR):

- Contains lots of medical information about a patient
- Updated in real time
- But no one can be watching these records all the time.

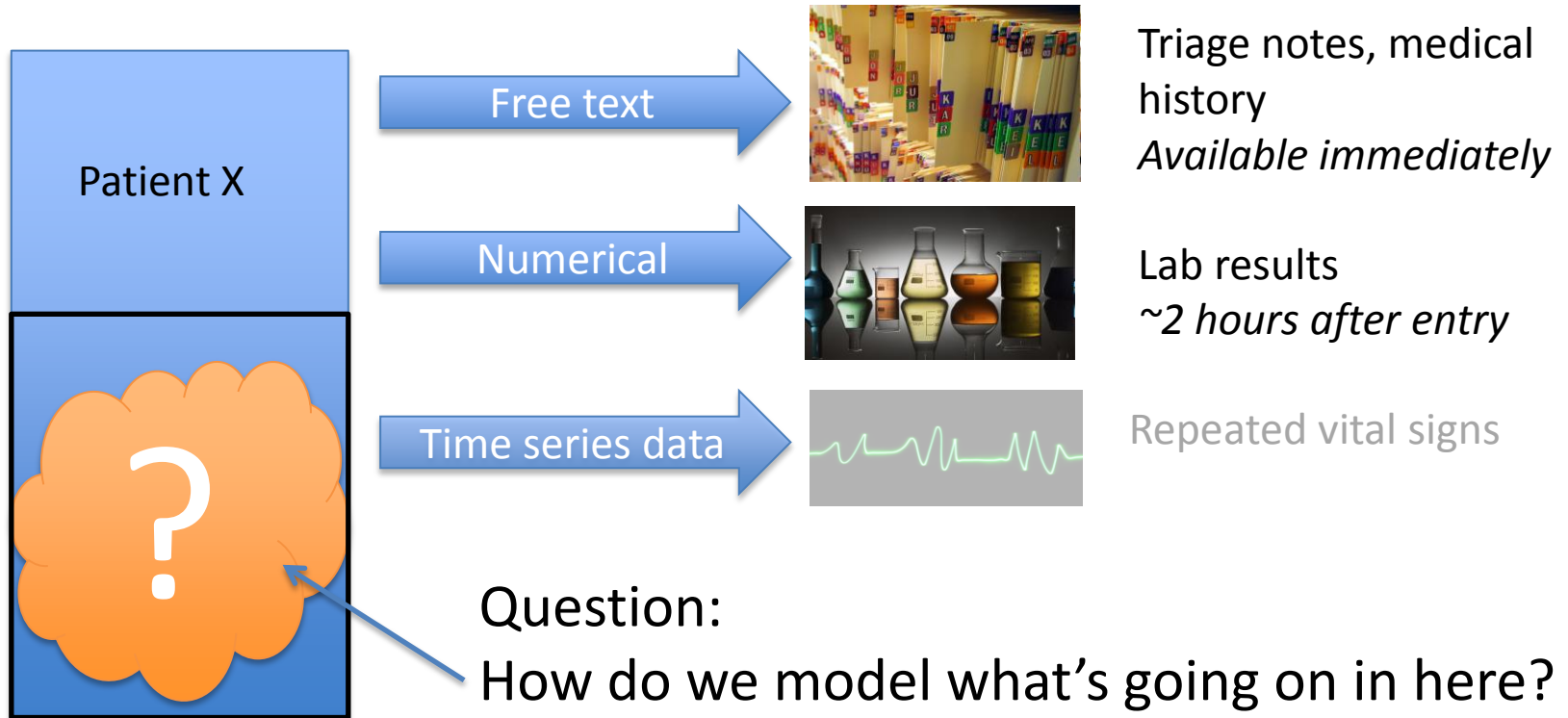
Can we build a model of a patient based on the information in the EMR so that a monitoring algorithm can pose clinical questions and possibly raise alerts if necessary.

## Example Application: Sepsis

- The body's severe reaction to infection
- Early goal directed therapy helps
  - *But has to be recognized early AND acted upon early*

For example: **Is this patient at risk for developing sepsis?**

# The EMR as a Generative Process

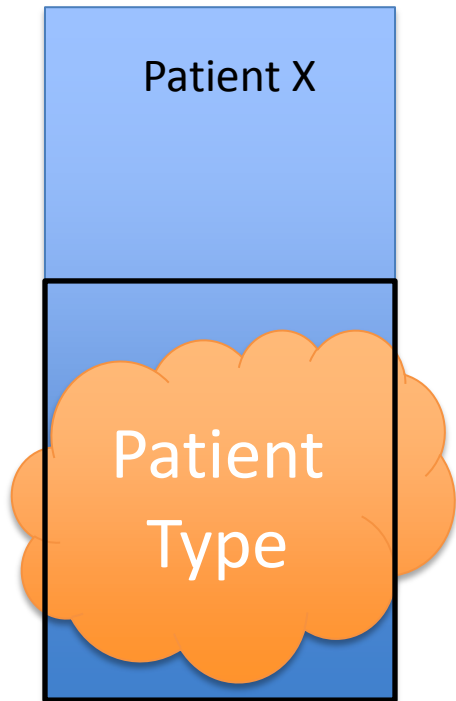


Previous work used just the triage notes represented by topic distributions to predict whether a patient is at risk for sepsis, with encouraging success.

# Possible Patient Representation

The topics discovered by topic modeling in the triage note can be a useful latent space to understand the lab values.

## Topics as Patient Types



Most likely words	Example highly ranked note
Pain knee left fall wrist shoulder ankle injury hand	Left leg pain 30 yr old woman from home afet ra trip and fall down 5 steps... pain in left leg from knee to ankle ...
Chest pain cp sob c/o sided left arm nausea radiating	Chest pain- pt with chest pressure x 24 hours radiating down left arm...